

Application Number 10/677,635
Responsive to Office Action mailed March 7, 2006

REMARKS

Claims 1-20 are currently pending in the application.

In this response, claims 1-16 and 20 are drawn to a non-elected invention, and are cancelled without prejudice or disclaimer. Applicants reserve the right to file at a later date a divisional application directed to the subject matter of these claims.

Claims 17-19 are also cancelled without prejudice or disclaimer and replaced with new claims 21-35. Claims 21-35 are intended to more particularly describe the dielectric fluid that provides the beneficial improvement in the service life of paper transformer insulation materials. The embodiment described in the new claims is supported in the specification, for example, on page 11, lines 2-10 and page 4, line 18 to page 7, line 13.

In view of the above amendments and the following remarks, Applicants respectfully request further examination of the application and reconsideration of the rejections set forth in the Office Action dated March 7, 2006

I. Claim Rejection Under 35 U.S.C. § 112

On page 2 of the Office Action, paragraphs 3-5, claim 19 is rejected under the second paragraph of 35 U.S.C. § 112 as indefinite

Claim 19 is cancelled in this response, so this rejection will not be further addressed.

II. Claim Rejections Under 35 U.S.C. §§ 102/103(a)

On pages 3-5 of the Office Action, paragraphs 10-11, claims 17-19 are rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over two references to McShane et al., U.S. Patent Nos. 6,398,986 and 6,613,250. As grounds for these rejections it is noted that the cited references describe compositions with less than 50% by weight of mineral oil (col. 4, lines 53-67). It is also noted that these compositions may be used in transformers with paper insulating materials (col. 9, lines 43-62 of '986 and col. 9, lines 44-65 of '250).

Applicant respectfully traverses the rejection to the extent such rejection may be considered applicable to the amended claims. The cited '986 and '250 references fail to disclose each and every feature of the claimed invention, as required by 35 U.S.C. § 102(b), and provide no teaching that would have suggested the desirability of modification to include such features.

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The amended claims are directed to methods for extending the service life of paper insulating materials in an electrical device by impregnating the materials with a dielectric fluid including 5-25% by weight of a natural or a synthetic ester compound. As discussed in detail in the working examples on pages 13-15 of the specification, the increased service life of the insulating paper materials may be measured with accelerated aging tests using a number of standard test procedures, including evaluating the tensile strength of the paper (ASTM 828), the extent of polymerization of the paper (ASTM D4243), the amount of moisture in the paper (ASTM D3277), and the amount of CO and/or CO₂ gas dissolved in the dielectric fluid (ASTM D3612). The working examples established that, for example, incorporation into an electric device of a dielectric fluid including an ester based compound and a conventional mineral oil extended the life of the insulating paper in the device compared to use of a dielectric fluid including a conventional mineral oil alone.

The cited references teach for use in transformers a dielectric fluid including less than 50% by weight, more preferably less than 20% by weight, of a petroleum derived mineral oil, about 50-80% by weight of a vegetable oil, and relatively minor amounts of additives such as antioxidants.¹ These dielectric fluids meet or exceed safety and performance standards for dielectric fluids, and are free of substantial environmental hazards.² These dielectric fluids are compatible with transformer components that are insulated with both cellulosic and non-cellulosic materials.³

In contrast, the presently claimed method is directed to inhibiting the breakdown of paper insulating materials in transformers by incorporating into the transformer a dielectric fluid that has 5-25% by weight of a natural or synthetic ester compound, a minor amount (about 1-2.5% by weight) of an additive such as an antioxidant or a pour point depressant, and the balance of a traditional dielectric fluid component such as a petroleum-derived mineral oil or an α -polyolefin. The cited references teach that the vegetable oil dielectric fluid must be the principal component (greater than about 50% by weight) of the composition, while the presently claimed method utilizes dielectric fluid compositions in which the natural or synthetic ester compounds are

¹ See, e.g. '986 patent, col. 4, line 49-66; col. 7, line 59 to col. 8, line 16.

² *Id.*, at col. 3, lines 4-8.

³ *Id.*, at col. 9, lines 44-65; col. 11, line 66 to col. 12, line 5.

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present in moderate amounts of 5-25 wt%.⁴ For at least this reason, Applicants respectfully submit that the method set forth in claims 21-35 is not anticipated under 35 U.S.C. § 102(b) by either of the '986 and '250 McShane references.

In addition, while the dielectric fluids described in the cited references are may be used in transformers with cellulosic insulating materials, this only addresses the issue of compatibility with known transformer components. Compatibility is significantly different from the goal of the presently claimed method, which is extending the useful life of paper insulating materials in an electrical device. The cited references fail to recognize or appreciate that the incorporation of even a moderate amount of a natural or synthetic ester compound can inhibit the breakdown of the paper insulation in a traditional transformer dielectric fluid such as a mineral oil or an α -olefin. Further, based on the teachings of the cited references, a skilled artisan would have no incentive to reduce the amount of ester compound in the dielectric fluid below 50% to improve the service life of paper components in the transformer as presently claimed. For at least these reasons, Applicants respectfully submit that the method set forth in claims 21-35 is not prima facie obvious under 35 U.S.C. § 103(a) over either of McShane '986 or '250.

CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims.

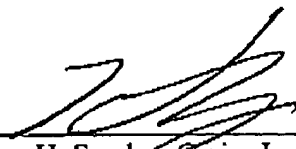
Please charge any additional fees or credit any overpayment to deposit account number 50-1778. If questions remain regarding the above, or if the Examiner wishes to discuss any aspect of this application, please contact the undersigned.

Date:

June 7, 2006

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⁴ See specification, page 3, lines 22-25.